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(54) Improved electrophysiological mapping and ablation catheter and method

(57) A mapping and ablating catheter having a short distal tip electrode (40, 58, 68), comprising a bio-compatible outer surface and a thermal dissipating mass for dissipating heat received by the electrode. The outer surface may be formed by plating a thin layer of gold or platinum on the dissipating mass, or the entire electrode may be formed of a homogenous material such as a gold alloy that is bio-compatible thereby forming the outer surface with the mass itself. An alloy having a thermal

conductivity greater than pure platinum is used so that the ablation procedure can be completed before exceeding the temperature limits. In one case, the entire electrode was formed of an 88% gold 12% nickel alloy. The electrical feed to the electrode is oversized to also dissipate heat received by the electrode. The electrode is no greater than five mm in length yet produces an ablation volume equal to or greater than longer electrodes. One or more band electrodes (70) may also include thermal dissipating masses.

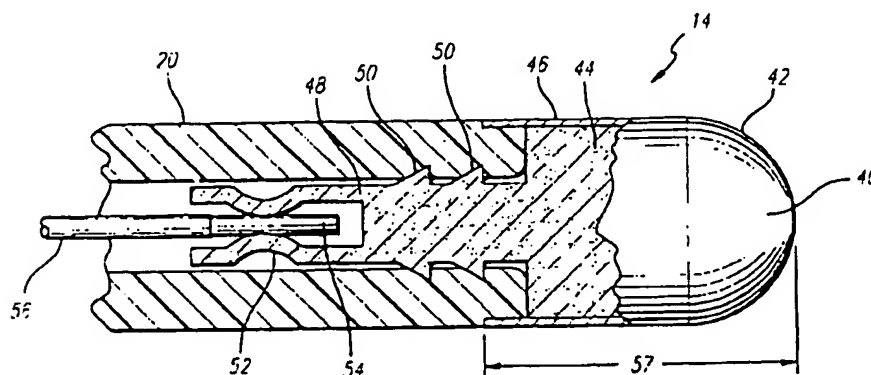


FIG. 4

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## PARTIAL EUROPEAN SEARCH REPORT

Application Number

which under Rule 45 of the European Patent Convention EP 95 30 0413  
shall be considered, for the purposes of subsequent  
proceedings, as the European search report

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	WO 92 02272 A (SENSOR ELECTRONICS INC) 20 February 1992 * page 1, line 13 - line 18 * * page 2, line 6 - page 3, line 12 * * page 5, line 16 - page 6, line 18 * * page 7, line 26 - line 33 * * page 9, line 18 - line 31 * * page 11, line 22 - page 13, line 4 * * figures 1,3,4 *	1,2,4, 6-8,11	A61B5/042 A61N1/05 A61B17/39 A61N1/40
X	WO 93 20769 A (IMPLEMED INC) 28 October 1993 * page 5, line 1 - line 31 * * page 6, line 15 - line 27 * * figures *	1,3,4,11	
A	---	8	
A	US 4 449 528 A (AUTH DAVID C ET AL) 22 May 1984 * column 2, line 37 - column 3, line 17 * * column 6, line 55 - line 60 * * column 7, line 25 - line 38 * * column 8, line 9 - column 13 * * figure 5 *	1,3-6, 10,11	
			TECHNICAL FIELD(S) SEARCHED (Int.Cl.6)
			A61N A61B
-/-			
INCOMPLETE SEARCH			
<p>The Search Division considers that the present European patent application does not comply with the provisions of the European Patent Convention to such an extent that it is not possible to carry out a meaningful search into the state of the art on the basis of some of the claims.</p> <p>Claims searched completely: 1-11</p> <p>Claims searched incompletely:</p> <p>Claims not searched: 12-13</p> <p>Reason for the limitation of the search: Article 52 (4) EPC - Method for treatment of the human or animal body by surgery</p>			
Place of search		Date of completion of the search	Examiner
THE HAGUE		16 September 1997	Ferrigno, A
CATEGORY OF CITED DOCUMENTS			
<p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background U : non-written disclosure P : intermediate document</p> <p>I : theory or principle underlying the invention F : earlier patent document, but published no, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>A : number of the same patent family, corresponding document</p>			

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Application Number

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Indicate)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	WO 93 15652 A (INTERFLO MEDICAL INC) 19 August 1993 * page 5, line 13 - line 27 * * page 11, line 26 - page 12, line 4 * * page 16, line 17 - line 20 * * page 18, line 25 - page 19, line 10 * ---	1,5,7,8	
A	WO 93 08755 A (EP TECHNOLOGIES) 13 May 1993 * the whole document * -----	1-11	
			TECHNICAL FIELDS SEARCHED (Indicate)